

**REMARKS**

In the Decision by the Board of Patent Appeals and Interferences, the Board upholds the rejection of claims 1-16, 8-14, 16, 17 and 19-27 under 35 U.S.C. §

103. In the final Office Action, dated December 29, 2006, the Examiner:

- rejects claims 1-5, 16, 17, 19-21, 23 and 27 under 35 U.S.C. § 103(a) as allegedly unpatentable over AYERS (U.S. 6,687,220) and SHAFER (2002/0198974);
- rejects claims 8-14 under 35 U.S.C. § 103(a) as allegedly unpatentable over ALFIERI (U.S. 2002/0099849) and SHAFER;
- rejects claim 1 and 2 under 35 U.S.C. § 103(a) as allegedly unpatentable over YLONEN (U.S. 2002/0062344) and SHAFER; and
- rejects claims 6, 22 and 24-26 under 35 U.S.C. § 103(a) as allegedly unpatentable over AYERS, SHAFER and ALFIERI.

Applicants traverse these rejections.

By way of the present amendment, Applicants cancel claims 2-6, 10-14, 17, 19-22 and 27 without prejudice or disclaimer and amend claims 1, 8, 16 and 23-26 to improve form. Applicants add new claim 28. No new matter has been added by way of the present amendment. Claims 1, 8, 9, 16, 23-26 and 28 are pending.

**Rejection under 35 U.S.C. § 103(a) based on AYERS and SHAFER**

Pending claims 1, 16 and 23 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over AYERS and SHAFER. Applicants traverse this rejection.

Amended independent claim 1 recites a device-implemented routing system comprising a plurality of device-implemented routing resources, including device-implemented logic resources including routing processes to determine routing for

received packets and forwarding processes to forward the received packets to an appropriate destination; and device-implemented physical resources comprising control resources and data resources, the control resources including at least one routing table and the data resources including physical specifications of the routing system; and a plurality of device implemented virtual routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements. AYERS and SHAFER, whether taken alone or in any reasonable combination, do not disclose or suggest the above-mentioned features of amended claim 1.

For example, AYERS and SHAFER do not disclose or suggest a plurality of device implemented virtual routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements. The Examiner admits that AYERS does not disclose resources that are programmably modifiable and relies on ¶ [0004] of SHAFER for allegedly disclosing this feature. (Final Office Action, p. 2.) Applicants submit that this alleged disclosure of SHAFER does not address the above-mentioned feature of amended claim 1.

AYERS is directed to a method and system for controlling the processing of data packets in a packet data router configured to support a plurality virtual router

instances. Each virtual router instance stores received data packets in one or more respective ingress data queues. (See Abstract.) AYERS discloses a memory manager 53 that monitors ingress data queues of virtual routers 50 and 52 and increases or decreases an amount of memory allocated to the data queues. (See col. 9, l. 64 to col. 10, l. 1.) Even if this disclosure of AYERS can reasonably be construed to disclose that memory allocation adjustments are based on programmably modifiable factors, this disclosure of AYERS does disclose or suggest a plurality of device implemented virtual routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements, as recited by amended claim 1. In fact, AYERS does not even mention a plurality of programmably modifiable resource sharing configurations that may be reconfigured by a user based on network requirements.

Para. [0004] of SHAFER discloses a network router management interface that offers different presentation modes for viewing configuration and operation information encoded in extensible markup language obtained from a network router. Using the management interface, a user can make changes to router resources. SHAFER, however, does not disclose or suggest a plurality of device implemented virtual routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations

based on different sets of network requirements, as recited by amended claim 1.

Therefore, the disclosure of SHAFER does not remedy the deficiencies in the disclosure of AYERS, as given above with respect to amended claim 1.

For at least the foregoing reasons, Applicants submit that amended claim 1 is patentable over AYERS and SHAFER, whether taken alone or in any reasonable combination. Thus, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of amended claim 1 under 35 U.S.C. § 103(a) based on AYERS and SHAFER.

Amended independent claims 16 and 23 recite features similar to (yet possibly of different scope than) features described above with respect to amended claim 1. Therefore, Applicants submit that amended claims 16 and 23 are patentable over AYERS and SHAFER, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to amended claim 1. Thus, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of amended claims 16 and 23 under 35 U.S.C. § 103(a) based on AYERS and SHAFER.

**Rejection under 35 U.S.C. § 103(a) based on ALFIERI and SHAFER**

Pending claims 8 and 9 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over ALFIERI and SHAFER. Applicants traverse this rejection.

Amended independent claim 8 recites a network point-of-presence (POP) comprising a single physical router having a plurality of resources, including logic resources, including routing processes to determine routing for received packets and forwarding processes to forward the received packets to an appropriate destination; and physical resources comprising control resources and data

resources, the control resources including at least one routing table and the data resources including physical specifications of the single physical router; at least one backbone router, having a routing capacity, implemented, at an end-point of a high capacity network link, as a virtual router by the single physical router; and at least one regional router, having a routing capacity that is below the routing capacity of the at least one backbone router, implemented as a virtual router by the single physical router, where the backbone virtual router and the regional virtual router to reconfigurably share resources of the single physical router based on a plurality of configurations and an input by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements. ALFIERI and SHAFER, whether taken alone or in any reasonable combination, do not disclose or suggest the above-mentioned features of amended claim 8.

For example, ALFIERI and SHAFER do not disclose or suggest that the backbone virtual router and the regional virtual router are to reconfigurably share resources of the single physical router based on a plurality of configurations and an input by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements. The Examiner admits that ALFIERI does not disclose resources that are modifiable by a user and relies on ¶ [0004] of SHAFER for allegedly disclosing this feature. (Final Office Action, p. 7.) Applicants submit that this alleged disclosure of SHAFER does not address the above-mentioned feature of amended claim 8.

As discussed above, ¶ [0004] of SHAFER discloses a network router management interface that offers different presentation modes for viewing

configuration and operation information encoded in extensible markup language obtained from a network router. Using the management interface, a user can make changes to router resources. SHAFER, however, does not disclose or suggest the backbone virtual router and the regional virtual router are to reconfigurably share resources of the single physical router based on a plurality of configurations and an input by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements, as recited by amended claim 8. Therefore, the disclosure of SHAFER does not remedy the deficiencies in the disclosure of ALFIERI, as given above with respect to amended claim 8.

Pending claim 9 depends from amended claim 8. Therefore, claim 9 is patentable over ALFIERI and SHAFER, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to amended claim 8.

**Rejection under 35 U.S.C. § 103(a) based on YLONEN and SHAFER**

Pending claim 1 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over YLONEN and SHAFER. Applicants traverse this rejection.

As discussed above, amended independent claim 1 recites a device-implemented routing system comprising a plurality of device-implemented routing resources, including device-implemented logic resources including routing processes to determine routing for received packets and forwarding processes to forward the received packets to an appropriate destination; and device-implemented physical resources comprising control resources and data resources, the control resources including at least one routing table and the data resources including physical specifications of the routing system; and a plurality of device implemented virtual

routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements. YLONEN and SHAFER, whether taken alone or in any reasonable combination, do not disclose or suggest the above-mentioned features of amended claim 1.

For example, YLONEN and SHAFER do not disclose or suggest a plurality of device implemented virtual routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements. The Examiner admits that YLONEN does not disclose resources that are programmably modifiable and relies on ¶ [0004] of SHAFER for allegedly disclosing this feature. (Final Office Action, p. 2.) Applicants submit that this alleged disclosure of SHAFER does not address the above-mentioned feature of amended claim 1.

As discussed above, ¶ [0004] of SHAFER discloses a network router management interface that offers different presentation modes for viewing configuration and operation information encoded in extensible markup language obtained from a network router. Using the management interface, a user can make changes to router resources. SHAFER, however, does not disclose or suggest a plurality of device implemented virtual routers to reconfigurably share the device-implemented routing resources in accordance with a plurality of programmably

modifiable resource sharing configurations that may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements, as recited by amended claim 1. Therefore, the disclosure of SHAFER does not remedy the deficiencies in the disclosure of YLONEN, as given above with respect to amended claim 1.

For at least the foregoing reasons, Applicants submit that amended claim 1 is patentable over YLONEN and SHAFER, whether taken alone or in any reasonable combination. Thus, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of amended claim 1 under 35 U.S.C. § 103(a) based on YLONEN and SHAFER.

**Rejection under 35 U.S.C. § 103(a) based on AYERS, SHAFER and ALFIERI**

Pending claims 24-26 under 35 U.S.C. § 103(a) as allegedly unpatentable over AYERS, SHAFER and ALFIERI. Applicants traverse this rejection.

Pending claim 24-26 depend from amended claim 23. Therefore, without acquiescing in this rejection, Applicants submit that the disclosure ALFIERI does not remedy the deficiencies in the disclosures of AYERS and SHAFER, as given above with respect to amended claim 23. Therefore, claims 24-26 are patentable over AYERS, SHAFER and ALFIERI, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to amended claim 23.

**New Claims**

New independent claim 28 recites a method, performed by a single router in a network, comprising allocating a set of routing resources as shared resources,



where the allocating the set of resources includes allocating logic resources, including routing processes to determine routing for received packets and forwarding processes to forward the received packets to an appropriate destination; and allocating physical resources comprising control resources and data resources, the control resources including at least one routing table and the data resources including physical specifications of the single device; selecting, by a user, a first desired resource sharing configuration, based on a first set of network requirements, to be implemented by a plurality of virtual routers, from a plurality of routing resource sharing configurations, the plurality of routing resource sharing configurations including a first configuration, where the plurality of virtual routers do not share resources; a second configuration, where the plurality of virtual routers only share control resources; a third configuration, where the plurality of virtual routers only share data resources; a fourth configuration, where the plurality of virtual routers only share data resources and forwarding processes; a fifth configuration, where the plurality of virtual routers only share data resources and routing processes; a sixth configuration, where the plurality of virtual routers only share data resources, forwarding processes and routing processes; a seventh configuration, where the plurality of virtual routers only share data resources and control resources; an eight configuration, where the plurality of virtual routers only share data resources, forwarding processes and control resources; a ninth configuration, where the plurality of virtual routers only share data resources, routing processes and control resources; and a tenth configuration, where the plurality of virtual routers share data resources, routing processes, forwarding processes and control resources; implementing the plurality of virtual routers based

on the first desired resource sharing configuration; implementing a second desired resource sharing configuration, different than the first desired resource sharing configuration, based on a second set of network requirements, different than the first set of network requirements. Applicants submit that the art of record, whether taken alone or in any reasonable combination, does not disclose or suggest this combination of features.

### **Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully request the Examiner's reconsideration of this application and the timely allowance of the pending claims. Should the Examiner find some issue to remain unresolved, or should any new issues arise which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone to expedite prosecution of this application.

As Applicants' remarks with respect to the Examiner's assertions are sufficient to overcome these assertions, Applicants' silence as to assertions by the Examiner in the Office Action or certain requirements that may be applicable to such assertions (e.g., whether a reference constitutes prior art, reasons to modify a reference and/or to combine references, assertions as to dependent claims, etc.) is not a concession by Applicants that such assertions are accurate or such requirements have been met, and Applicants reserve the right to analyze and dispute such assertions/requirements in the future.

To the extent necessary, a petition for an extension of time under 37 C.F.R.

§ 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,  
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